Gear Units, K Series

Edition 01/2005
OIKEX 0101/0105

Operating Instructions

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1 -How To Use This Manual

Take attention to the following safety and warning signs for proper understanding and quick reference.

Electric Hazard; Can cause severe or fatal injuries.

Mechanical Hazard; Can cause severe or fatal injuries.

Likely to be Hazardous; Can cause minor injuries

Damage Risk; Can damage the drive or environment

Important Information

Important information about explosion protection

The operating instructions contain important information to ensure;
- Trouble-free operation
- Fulfilment of any rights to claim under guarantee

The operating instruction must be kept close to the gearbox and must be available in case it is needed.

This operating instruction is written for K series gear units and is applicable only for these series. If any different type of gearbox is used please ask STOEWER for the operating instructions of that type.

This instruction can be used only for standard type geared units For special application- and modified gear units ask Stöwer for validity.

The KN/KT Series garboxes are with standard IEC B5/B14 connection flange and without motor. The electric motor which will be connected to the gearbox must also be in confirmity with the ATEX (94/9/EC) standarts.

All the external parts which will be assembled to the gear unit must conform ATEX (94/9/EC). The product this decleration refers to must not be put into service until the machinery into which it is to be incorporated has been declared in confirmity with the provisions of the relevant European Directives.

If the gear unit is not operated as informed on this manual the gear unit is no longer ATEX conforming and Stoewer does not take any responsibility.

2 -Unit Designation

a- Detailed unit designation

Detailed K series gear units designation for ordering
(This Designation is different from the short nameplate designation)

3,0kW - 29rpm - 48,86 - KN373 - A09

- 3,0kW — *Power (kW)*
- 29rpm — *Output Speed(rpm)*
- 48,86 — *Ratio (i)*
- KN373 — *Type*
  - **KN** -*Foot mounted type with IEC flange without motor*
  - **KT**- *Flange mounted without motor*
- A09 — *Motor Size*
  - A07- IEC 71 B5
  - A08- IEC 80 B5
  - A09- IEC 90 B5
  - A10- IEC 100 B5
  - A11- IEC 112 B5
  - A13- IEC 132 B5
  - A16- IEC 160 B5
  - A18- IEC 180 B5
  - A20- IEC 200 B5
  - A22- IEC 220 B5
  - A25- IEC 250 B5

Examples

58,09-KN373-A08

KN373 foot mounted type geared with IEC80 B5 motor connection flange.

10,15-NT373

KT373 i=10,15, flange mounted type geared unit with solid input shaft

b- Nameplate, unit designation

Nameplate unit designation is a short abbreviation from the detailed designation

A sample name plate for KN. Series

CE			
Type:	KN373-A09 / 2GD		
S/N.:	04 / 2251 - EX		IP65
P	:1,5 kW	M_2	: 843 Nm
n_1	:1400 rpm	n_2	: 16 rpm
F_{R2}	:9542 N	F_{R1}	: - N
F_{A2}	:190 N	F_{A1}	: - N
Oil	:VG 220	Qty	: 4 lt
M.Pos.:	B3	T_a	: -20/+40 ºC
Ex II 2GD c,k T4 / T120 ºC			

Abreviations:

Type. : Type of gearbox
S/N: Serial Number of gear unit as; year/order no
IP..: Enclosure
P : Max. Allowed Power
M2: Output torque
n1: Input speed
n2: Output speed
FR2: Max. allowed radial load at output shaft
FR1: Max. allowed radial load at input shaft
FA2: Max. allowed axial load at output shaft
FA1: Max. allowed axial load at input shaft
Oil: Filled oil inside the gear unit
Qty.: Oil quantity
M.pos.: Mounting Position.
Ta: Ambient Temp

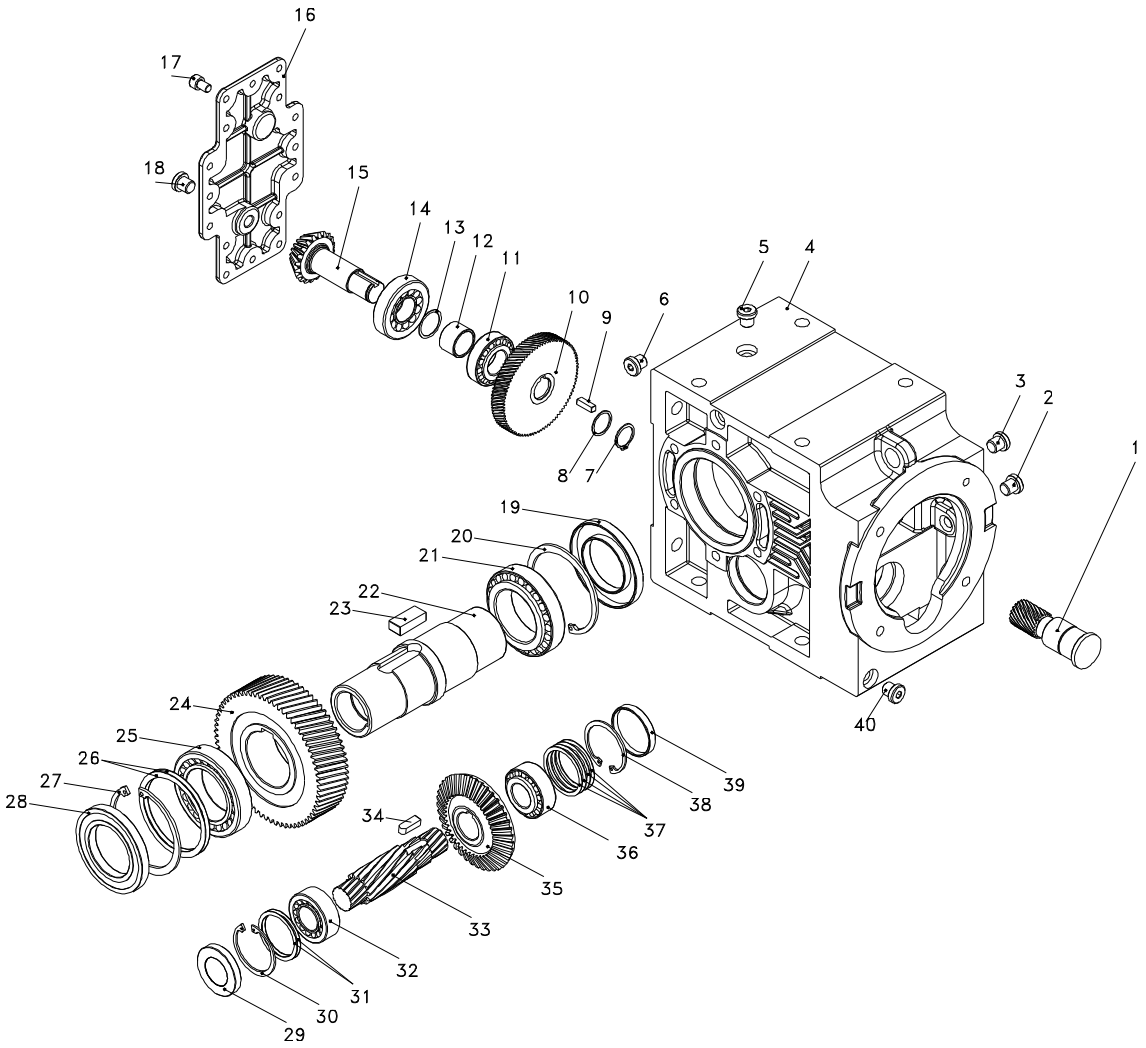
ATEX sign (EN 13463-1):

Ex II 2GD c,k T4 / T120°C

- II: Group: Only II, not for underground use
- 2GD: Catagorie; 2GD for gas and dust.
- c,k: Ignation Class
- T4: Temperature Class for 2G
- T120°C: Max. allowed surface temperature for 2D

3- Part List of Standard Type Gear Units

a- K...00... Types

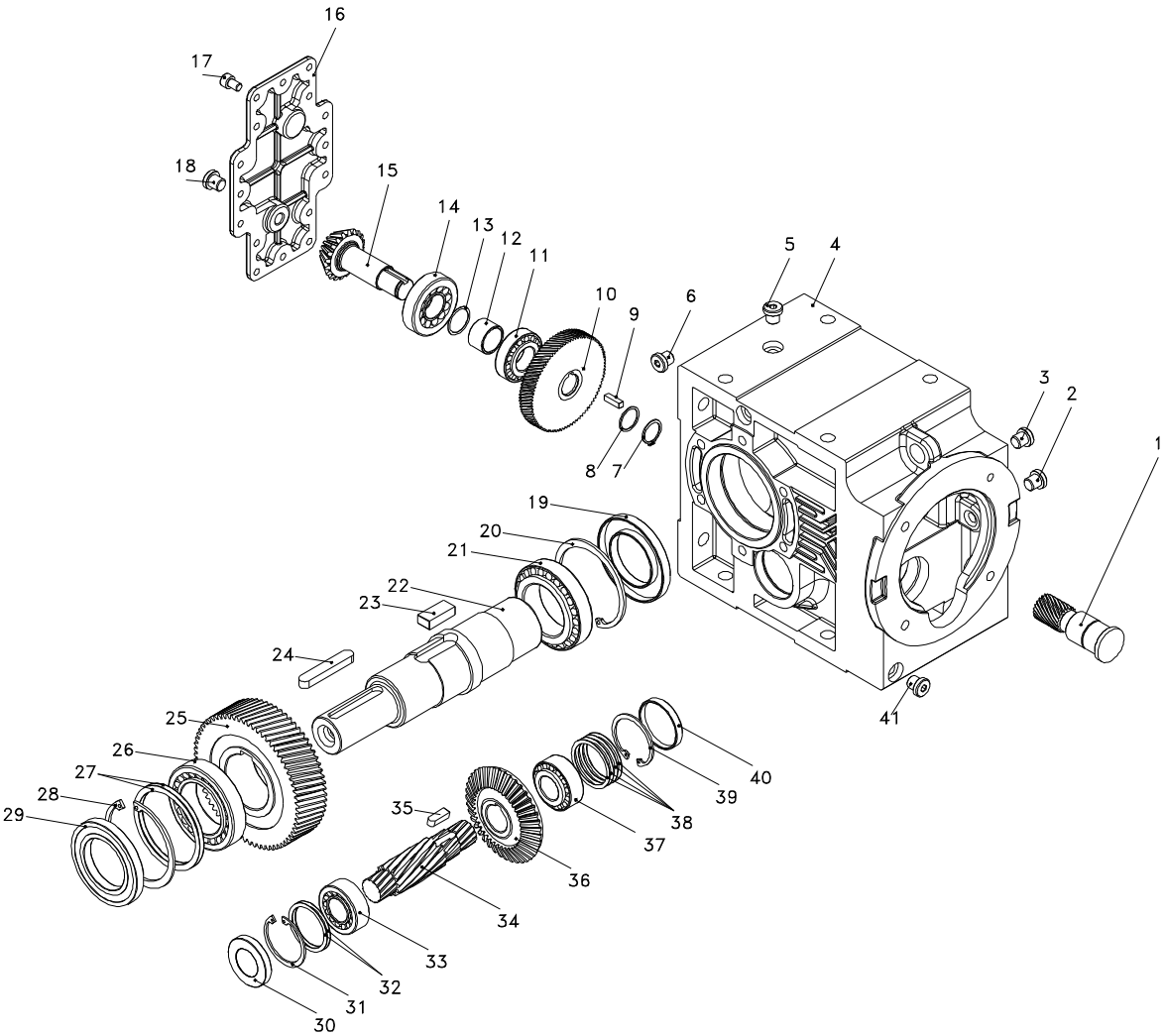


Standard KR...00... type basic part diagram. Parts may differ for special applications.

Standard Part List

1- Pinion	9- Key	17- Bolt	25- Bearing	33- Pinion Shaft
2- Plug	10- Gear	18- Plug	26- Shim Ring	34- Key
3- Plug	11- Bearing	19- Oil Seal	27- Circlip	35- Gear
4- Housing	12- Spacer	20- Circlip	28- Oil Seal	36- Bearing
5- Plug	13- Shim Ring	21- Bearing	29- Closing Cap	37- Shim Ring
6- Plug	14- Bearing	22- Output Shaft	30- Circlip	38- Circlip
7- Circlip	15- Pinion Shaft	23- Key	31- Shim Ring	39- Closing Cap
8- Shim Ring	16- Cover Plate	24- Gear	32- Bearing	

b- K...01... Types

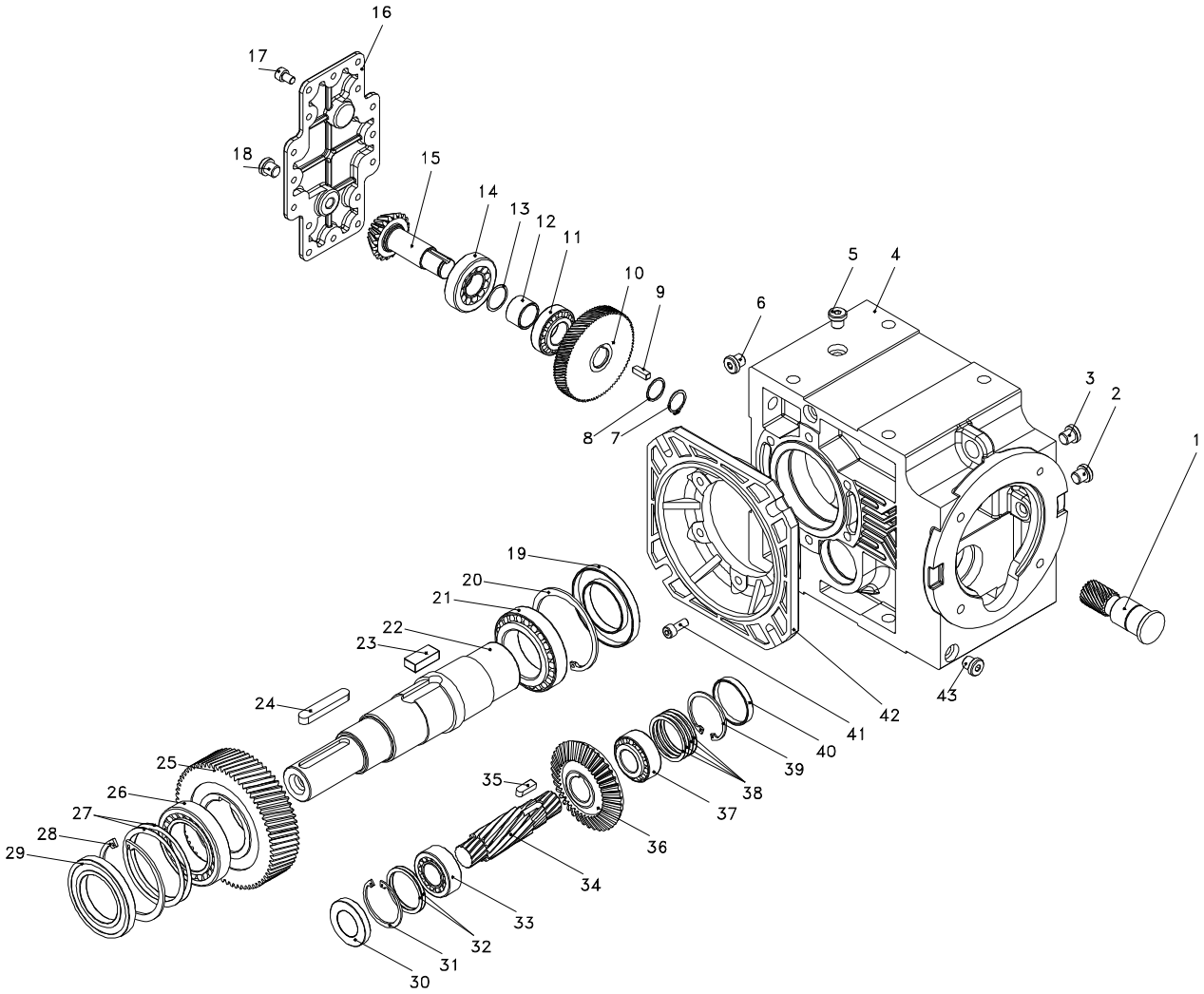


Standard KR...01... type basic part diagram. Parts may differ for special applications.

Standard Part List

1- Pinion	9- Key	17- Bolt	25- Gear	33- Bearing
2- Plug	10- Gear	18- Plug	26- Bearing	34- Pinion Shaft
3- Plug	11- Bearing	19- Oil Seal	27- Shim Ring	35- Key
4- Housing	12- Spacer	20- Circlip	28- Circlip	36- Gear
5- Plug	13- Shim Ring	21- Bearing	29- Oil Seal	37- Bearing
6- Plug	14- Bearing	22- Output Shaft	30- Closing Cap	38- Shim Ring
7- Circlip	15- Pinion Shaft	23- Key	31- Circlip	39- Circlip
8- Shim Ring	16- Cover Plate	24- Key	32- Shim Ring	40- Closing Cap

c- K...02... Types

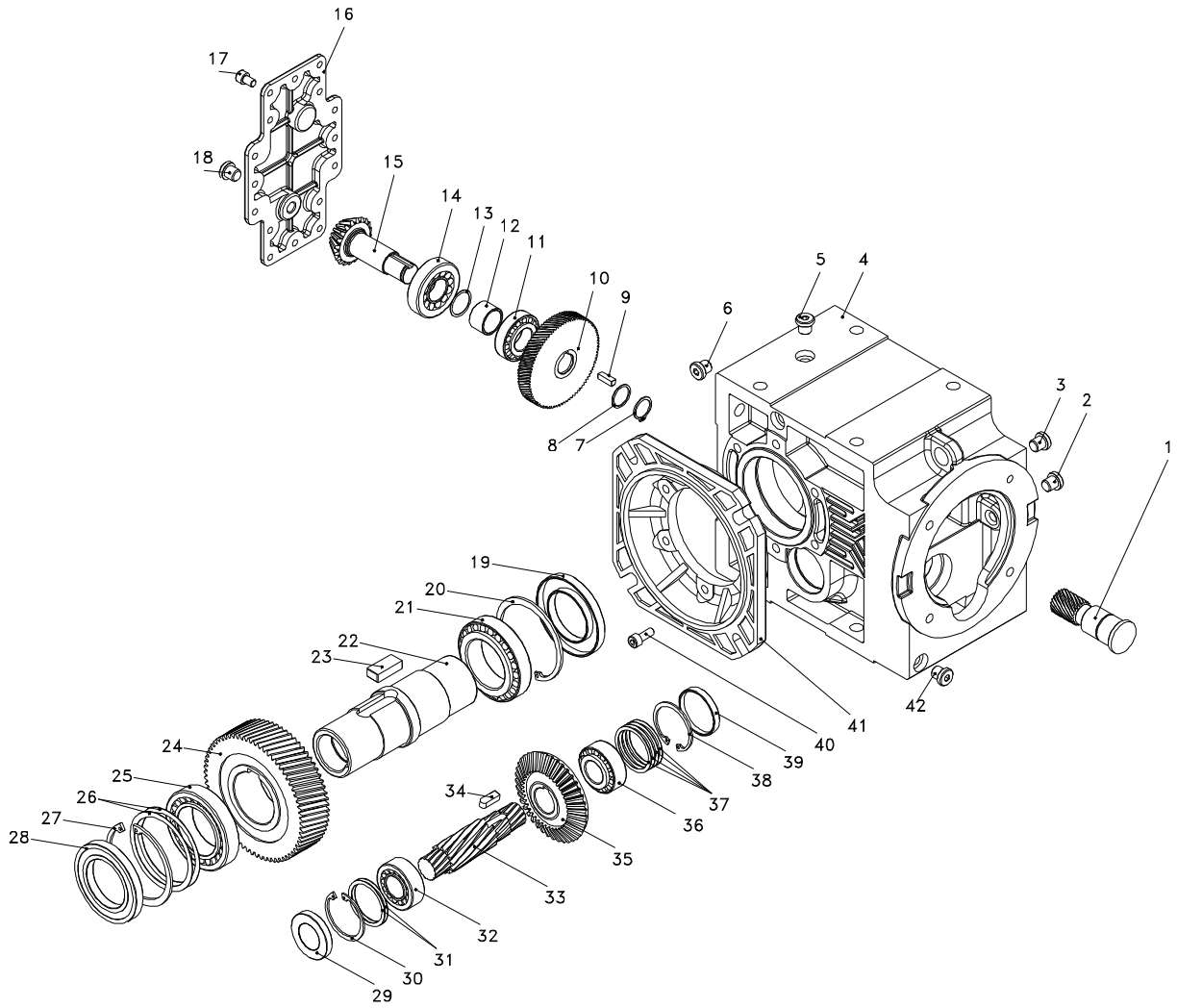


Standard KR...02... type basic part diagram. Parts may differ for special applications.

Standard Part List

1- Pinion	10- Gear	19- Oil Sealing	28- Circlip	37- Bearing
2- Plug	11- Bearing	20- Circlip	29- Oil Seal	38- Shim Ring
3- Plug	12- Spacer	21- Bearing	30- Closing Cap	39- Circlip
4- Housing	13- Shim Ring	22- Output Shaft	31- Circlip	40- Closing Cap
5- Plug	14- Bearing	23- Key	32- Bearing	41- Bolt
6- Plug	15- Pinion Shaft	24- Key	33- Bearing	42- Output Flange
7- Circlip	16- Cover Plate	25- Gear	34- Pinion Shaft	43- Plug
8- Shim Ring	17- Bolt	26- Bearing	35- Key	
9- Key	18- Plug	27- Shim Ring	36- Gear	

d- K...03... Types



Standard KR...03... type basic part diagram. Parts may differ for special applications.

Standard Part List

1- Pinion	10- Gear	19- Oil Sealing	28- Oil Seal	37- Shim Ring
2- Plug	11- Bearing	20- Circlip	29- Closing Cap	38- Circlip
3- Plug	12- Spacer	21- Bearing	30- Circlip	39- Closing Cap
4- Housing	13- Shim Ring	22- Output Shaft	31- Bearing	40- Bolt
5- Plug	14- Bearing	23- Key	32- Bearing	41- Output Flange
6- Plug	15- Pinion Shaft	24- Gear	33- Pinion Shaft	42- Plug
7- Circlip	16- Cover Plate	25- Bearing	34- Key	
8- Shim Ring	17- Bolt	26- Shim Ring	35- Gear	
9- Key	18- Plug	27- Circlip	36- Bearing	

4 -Thinks to Check Before the Gear Unit or Geared Motor is Installed

a) Safety notes for use in potentially explosive atmosphere

Explosive gas mixtures or concentration of dust can lead to severe or fata injuries in conjunction with hot or moving parts of the gear unit / gearmotor

Before you install the gearbox you have to be sure that the gearbox is arrived with the all necessary equipment and without damage. Thinks to take into consideration before you start to install the unit;
- You have received the correct operation manual of the your product.
- The gearbox and all its parts are transported without damage.
- The gearbox is stored correctly according the instructions in this manual
- The nameplate is clearly visible and all the data can be read.
- All the regulations and requirements according to the currently valid national/regional regulations.
- The gearbox is used according its intended use

Intended use of gearbox:
The gearboxes covered by this manuel can only be used in ATEX zone 2G,2D,3G,3D and ignation class IIA/IIB.

The gear units are intended for industrial systems and may only be used in accordance with the information provided in this manual and the nameplate of the gearbox. They comply with the applicable standards and regulations and meet the requirements of the directive 94/9/EC. The gearbox is started up, maintained and operated according this manual. The gearbox is incorporated with 94/9/EC confirming parts/machines.

A motor connected to the gear unit is only allowed to be operated in the frequency entries so that the data provided on nameplate of the gear unit is not exceeded and is accordance with the nameplate. The input speed range will be provided on the name plate of Stoewer is informed that the gear unit will be used with frequency inverter. If not informed formed the nameplate will have a single fixed input speed and only this input speed is allowed. The electric motor and frequency inverter must be in accordance with 94/9/EC

If the gear units input is used with variable speed gear unit, this must be informed to Stoewer before ordering and on the nameplate the allowed maximum and minimum input speeds (speed range) will be provided. If not mentioned by ordering the gear units input speed will be a fixes single input speed and only this speed is allowed.

If the gear unit will be driven by belt / coupling / chain drive etc. the gear unit is onlt allowed to be used according the nameplate entries. Diffrent speed, higher motor power, higher radial/axial loads etc. than nameplate is not allowed.

The ambient conditions must be accordance with the name plate and no agresive media must attack the paint and seals.

The gearbox maintanance (oil change / check) must be done according this manuel

b) Transportation

When the goods arrive, first check for any damage. If some damage observed, immediately contact the transport company and inform about the damage. Contact us for the damage and do not start to install the unit until it is agreed that the damage has no affect of operation.

Use the supplied eyebolts or lifting holes for lifting up the gear unit. The eyebolts are capable to carry the weight of gearboxes only. Do not hang additional loads.

c) Storage

If the geared unit or gearedmotor will be stored up to 3 years refer to the following instructions;

With Packing;

-Use corrosion protection oil for the output shaft and connection surfaces like flange surface or foot assembling surface. Seal the unit in a plastic wrap and pack it in container. A moisture indicator should be placed around the container to observe the moisture. Relative atmospheric humidity should not exceed 50%. The container should be kept under roof which protects from snow and rain. Under this condition the gear unit can be stored up to 3 year with regular check.

Without Packing;

-Use protection oil for the output shaft and connection surfaces like flange surface or foot assembling surface. If no packing is used and the gearbox is stored without packing, the ambient temperature should be between 5 to 60 Celsius degrees. The gearbox must be kept under enclosed roof with constant temperature and constant humidity not exceeding 50%. The storage should be free of dust and dirt and ventilated with filter. If the gearbox is stored without packing it is recommended not to store more than 2 years and regular check during this time is recommended.

If stored in open protect against insect damage.

5- Installing The Gear Unit

a) Before you start;
- Observe the gear unit for damages of storage or transportation. If any damage please contact STOEWER ANTRIEBSTECHNIK GmbH
- Be sure that you have all the equipment necessary for installing like; Spanners, torque wrench, shims and distance rings, fixing devices for input and output elements, lubricant, bolt adhesive etc.

b) Check nameplate of the gear unit;
- ATEX conforming gear gear units have a nameplate indicating the "EX" sign shown on the left side and the following information;
  - Equipment group
  - Ex category
  - Ex zone
  - Temprature class
  - Maximum surface temperature

If you can not see this sign and values, your gearbos is not intended for use on potentially explosive atmosphere. If some of the data can not be read because of some reason, please contact us.

c) Check the ambient conditions and temperature;
Have measures been taken to ensure that no potentially explosive atmosphere, oils, acids, gases, vapors or radiated interference are present when the gear unit is being installed.

The ambient temperature must be in accordance with the oil tables given on the manual. If different contact us for special solutions.

The ambient air temperature must not exceed 40 degrees celcius as mentioned on the name-plate. The cooling air surrounding the gear unit must bellow 40 degrees and the gear unit must not subject to heating from external sources. The gear unit surface must be kept clean and sufficiently ventilated.

d) Check fitting elements and the shaft dimensions to fit;

All external elements that will be fitted to the gear unit must be ATEX confirming.

The shaft/flange dimention are shown bellow. Use correct tolerances to fit external elements. Observe the assemly instructions provided in this manual.

Only belts with sufficient shunt resistance <10^9 ohm are allowed

Never strike belt pulleys, coupling, pinions etc. with a hammer when pulling them onto the shaft end. This could result in damage to bearings, the housing and the shaft.

Power transmision elements must be balanced after fitting and must not give rise to any impermissible radial or axial forces.

Observe the name plate for maximum allowed radial and axial load. The external radial and axil load must not exceed the provided values on the nameplate.

Type	Hollow Shaft Diameter	Hollow Shaft Tolerance (H8)	Output Shaft Diameter	Output Shaft Tolerance (DIN748) Up to 50mm k6 Over 50mm m6	Flange Centering Shoulder Diameter	Centering Shoulder Tolerance (g6)
K...37...	40	+0.04 0	40	+0.02 0	180	-0.02 -0.04
K...47...	50	+0.04 0	50	+0.02 0	230	-0.02 -0.05
K...57...	60	+0.05 0	60	+0.03 +0.01	250	-0.02 -0.05
K...67...	70	+0.05 0	70	+0.03 +0.01	300	-0.02 -0.05
K...77...	90	+0.06 0	90	+0.04 +0.02	350	-0.02 -0.06
K...87...	110	+0.06 0	110	+0.04 +0.02	450	-0.02 -0.06

e) Check the voltage supply;
ATEX Conforming gear units are supplied by STOEWER without motor. The motor that will be fitted must have ATEX certificate and the instruction manual of the electric motor provider must be observed. Observe the name plate of the electric motor and the instructions of the supplier. Check the basic electric connection diagrams below. Use experienced electric technician. The gearbox and the motor must be grounded to prewent potential differences of earth and gearbox/motor.

Using wrong connection or voltage can damage the electric motor or environment.
The elctric connection must be done by experienced electric technician.

f) Check the mounting position;
The mounting position must be in accordance with the mounting position mentioned on the name plate. If different please contact STOEWER GmbH for possibilities of using in a different mounting position. Different use of mounting position than indicated on the name plate without informing STOEWER will cancel the ATEX confirmity and STOEWER does not take any responsibility.

STOP

Do not mix synthetic oils with mineral oils which can cause serious damage on the gear unit.

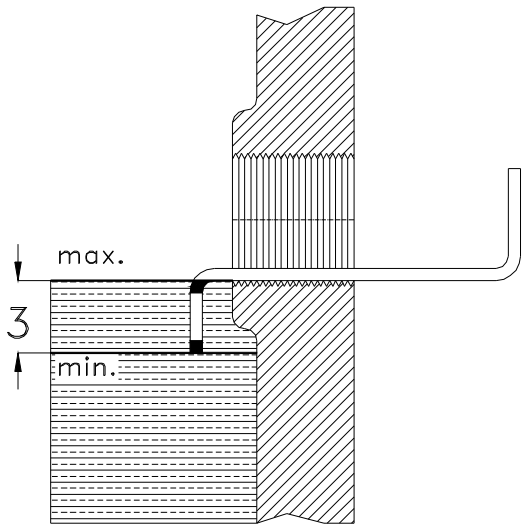
g) Use of breather plug;
Breather plugs are supplied as a standard part for ATEX conforming gear units. The breather plug is attached to the gear unit and must be changed with the most top plug according to the mounting position.Take out the plug over the gear box and replace it with the supplied breather plug after assembling to its place and before start-up.

All plug points are not machined. Only plugs according mounting position is machined. If no mounting position is mentioned by ordering the standard B3 position plugs are machined.

h) Check the oil level ;
On the mounting position tables the oil level plug is shown. Please refer to those tables and be sure that the oil level is correct according the mounting position. Use a wire as shown below for checking the oil level entering from the level plug. The oil level must be within 3mm from the plugs entering point as shown below. If you need to adjust the oil level refer to the oil tables given on this manuel and be sure you are using the correct oil. Observe the nameplate for the correct oil.

STOP

Do not mix synthetic oils with mineral which can cause serious damage on the gear unit.



i) Check shaft ends and mounting faces;
Before you start to installing be sure that all the connection elements are free of oil and dust. The output shaft may be protected by anti-corrosion oil. Please remove this using available solvents on your market. By using this do not touch sealing lips or painting of the housing.

j) Cover abrasive ambient;
If the gear unit will be placed on a abrasive ambient be sure that the output seals are covered so that no abrasive material, chemicals or water touches the seals. Any pressure coming from outside over the seals can cause that the out staying substances to enter the gearbox and cause serious damage to the gear unit. If pressure or abrasive material can not be prevented from coming over the sealing, contact STOEWER for solutions.

Abrasive material, chemicals, water, positive or negative pressure exceeding 0,2 bar can affect or damage the sealing lip or output shaft. Inside entering substances from the seals can cause serious damage to the gear unit.

k) Check accessibility to filling, breather and drain plugs;
The filling, breather and drain plugs must be freely accessible for further checking and service.

6- Mechanical Installation

The mounting plate must be rigid enough not allowing torsions, flat enough to prevent strains by tightening the bolts and stable enough not allowing vibrations. By using chain drives this becomes much more important because of the polygon effect on chain drives. According to your connection elements the maximal permitted radial and axial load of the gear unit must be in accordance with your application. Check the product catalogue for permitted radial loads and calculation.

If the output or input shaft is overloaded by radial or axial loads it can cause serious damage to the gear unit.

Secure the gear unit using 8.8 or higher quality bolts.

All bolts are locked by use of locktide adhesives or gear-shims on the gearbox. By assembling the gear unit locktides adhesives or gear-shims must be used to prevent loosening of bolts.

Cover all the turning parts from human entering or touching. Turning parts can cause severe or fatal injuries.

For different kind of basic installations refer to the following illustrations.

Only ATEX-approved input and output elements are allowed to be used, assuming the elements are subject to Directive 94/9/EC

a- Installing gear units in category II2G/D-II3G/D

Explosion-proof gear units comply with the design requirements for unit group II, catagory 2G,2D,3D,3G. These units are intended for use in zones 1 and 21.

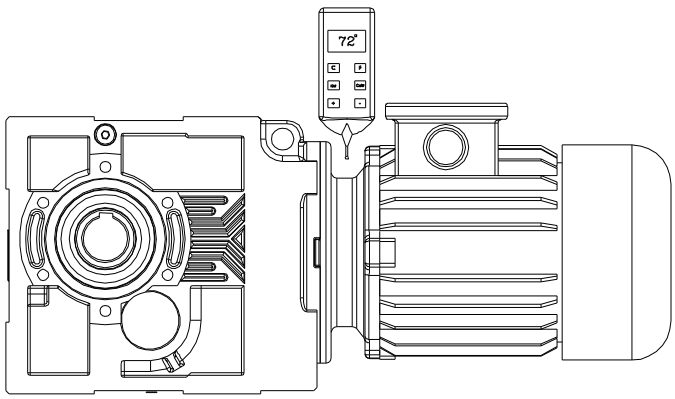
The gear units in catagory II2D must be used in ambient teperature between -20 C to +40 C only. If different ambient conditions this must be informed before order and the name plate must be in accordance with the ambient conditions.

The temperature class depends on the speed, type and mounting position of the gearbox and is indicated on the name plate. Temperature classes from T4 to T6 are provided

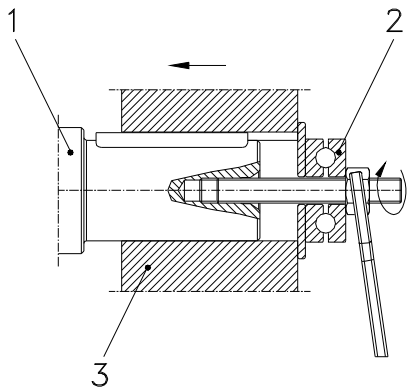
The surface temperature of the gearbox must not exceed the provided max. surface temperature on the name plate. After all installations finished and the gearbox is started up according this manual let the gear unit run 4 hours at full load and check the surface temperature from the shown point bellow and the ambient temperature. Check the following;

(40-Ta)+Tw < Tmax. of nameplate (Ta: Ambient Temp., Tw: Surface Temp)

If the result is higher then Tmax, immidiately stop the system and contact STOEWER

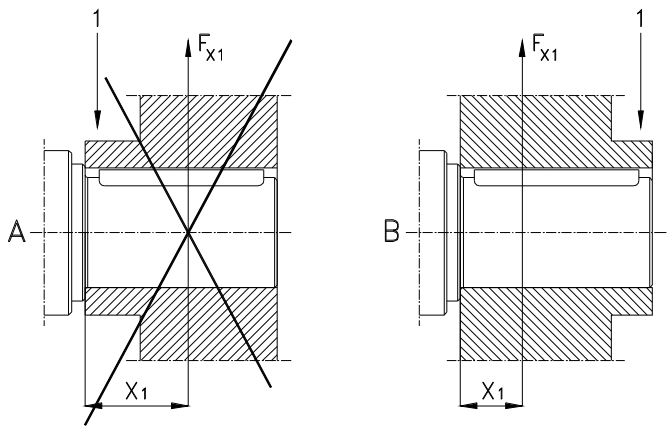


b- Fittting outputshaft elements
Use the following ilustration to assemble output shaft units



1) Gear shaft end
2) Thrust bearing
3) Coupling hub

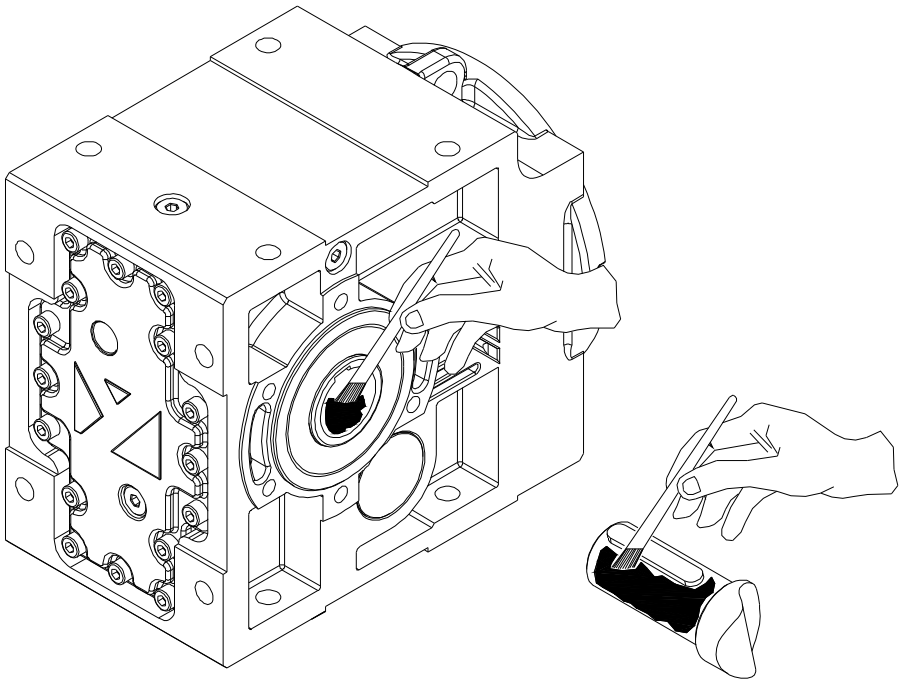
c- Correct position of otputshaft elements
The Output Shaft unit (transmision elements) must placed as close as possible to the gear unit so that the radial load is as closest as possible to the gear unit.



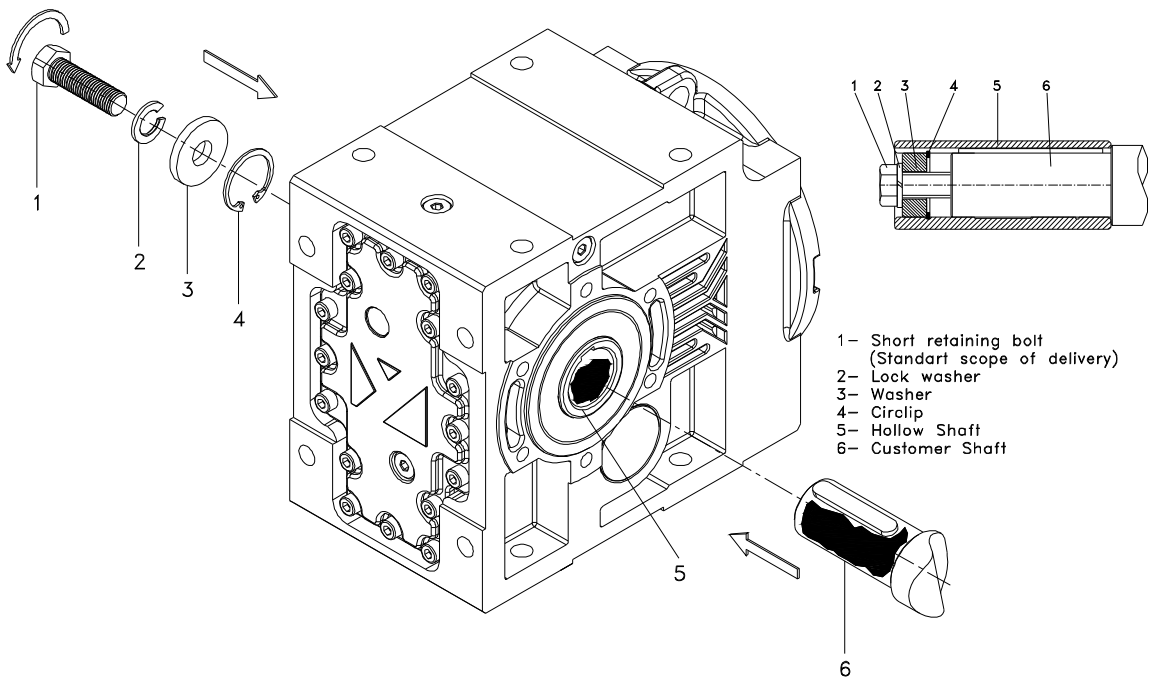
1) Hub

d- Installing customer shaft with shoulder

d1- Use anti-seize assembling paste available on your market. Use a brush to apply the paste.

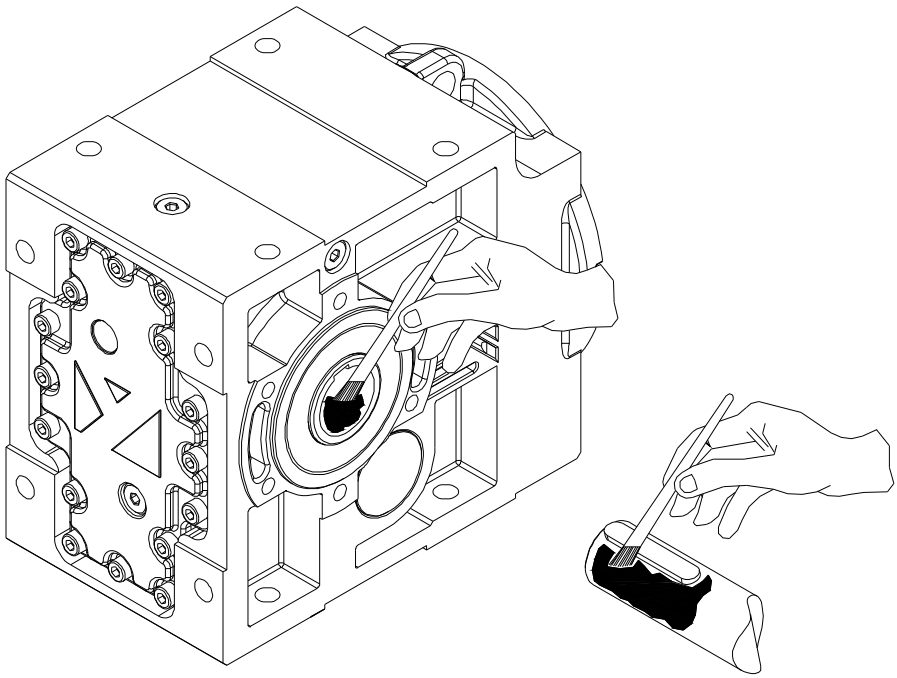


d2 -Fasten the bold as shown below.

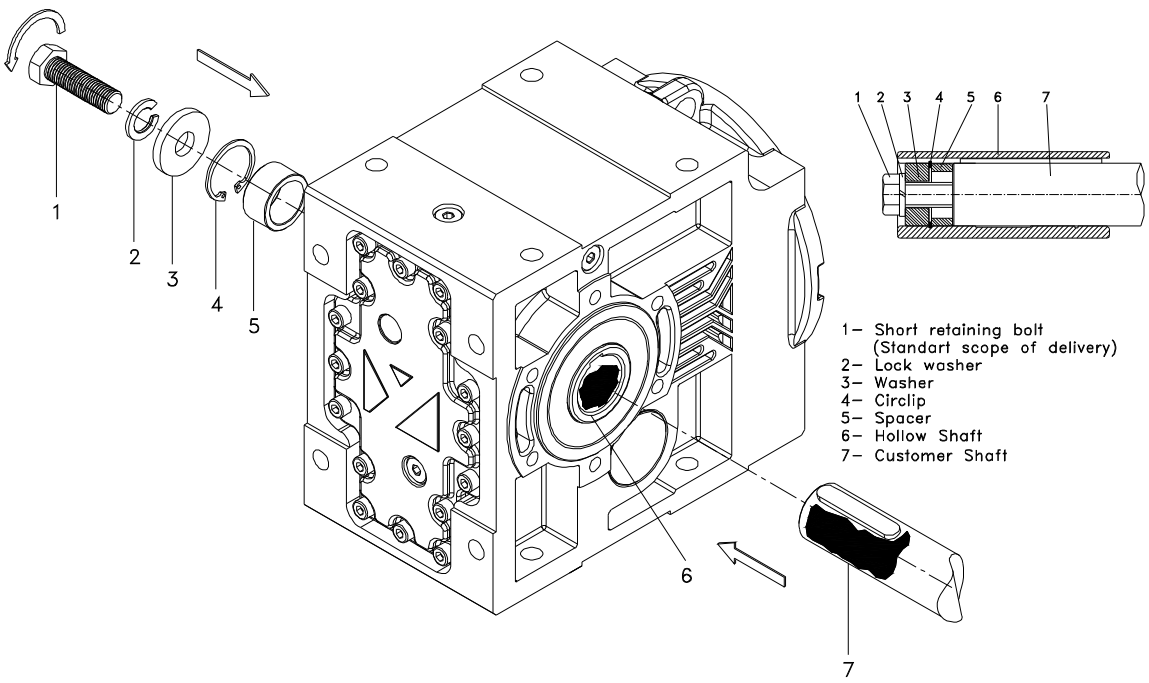


e- Installing customer shaft without shoulder

e1- Use anti-seize mounting paste available on your market. Use a brush to apply the paste.

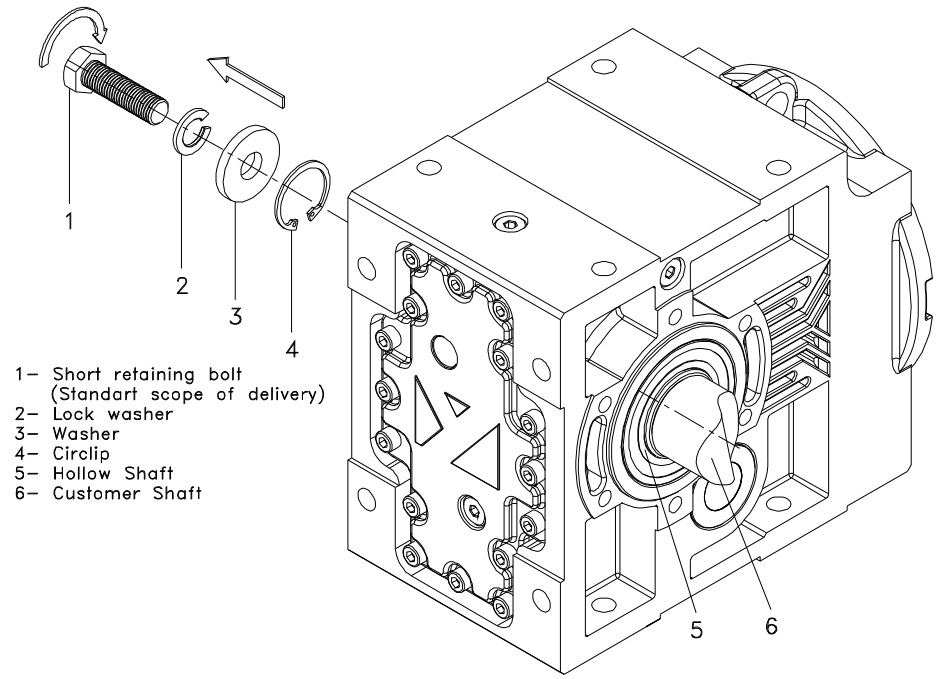


e2 -Fasten the bold as shown below.

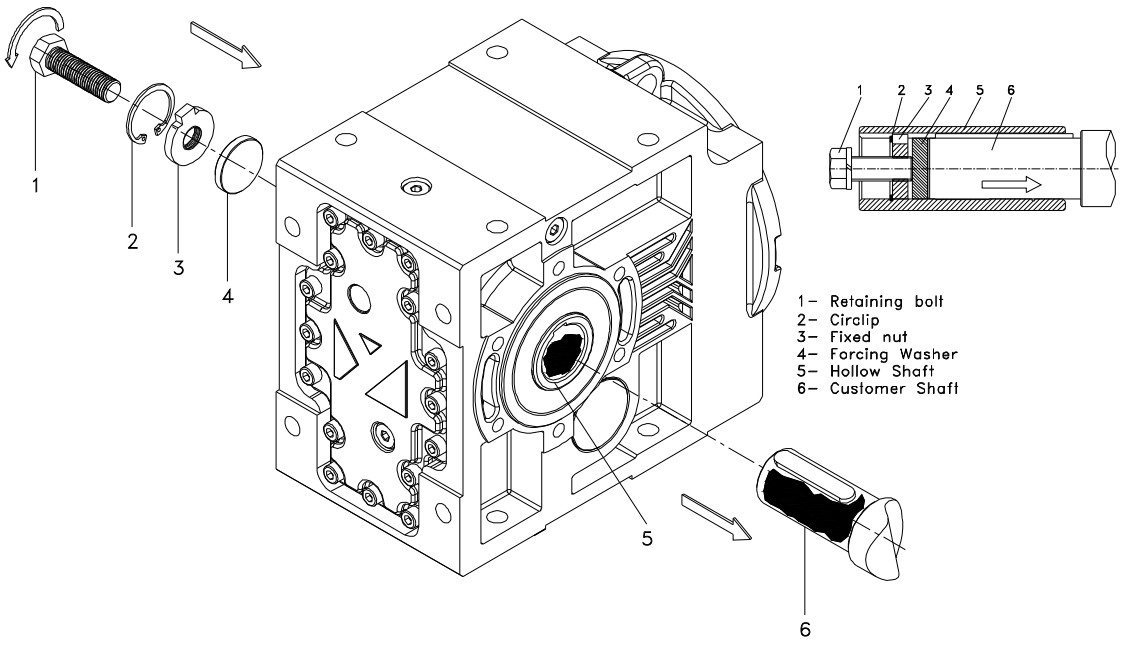


f- Disassembling customer shaft with shoulder

f1- Disassemble the bolt and take out the parts as shown

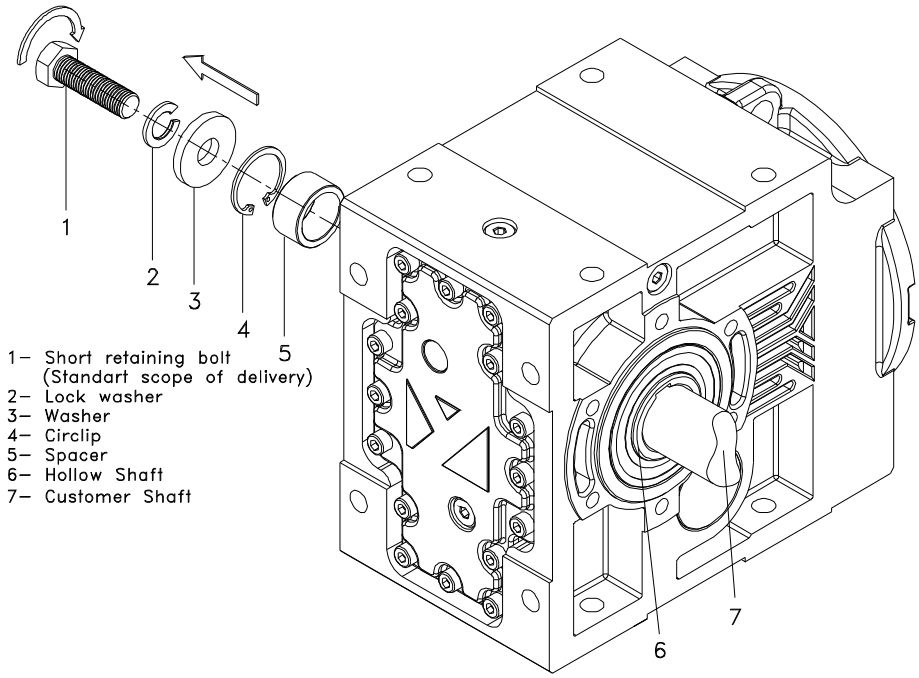


f2 -Use the disassemble set from STOEWER and fasten the bold as shown bellow to take out the output shaft. For disassemble sets look the following pages.

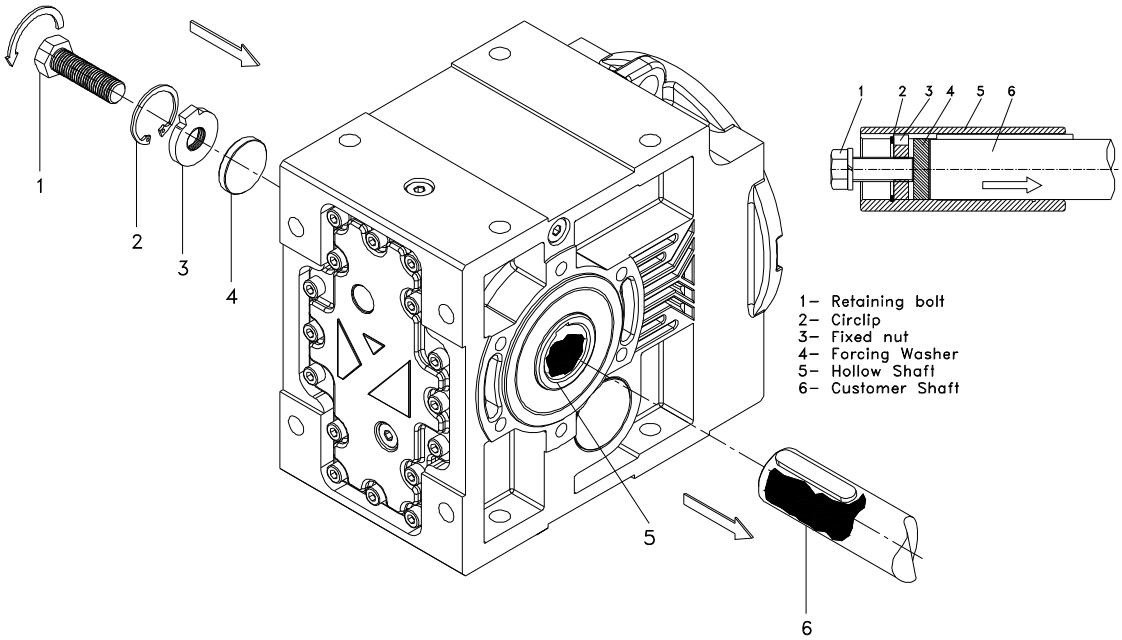


g- Disassembling customer shaft without shoulder

g1- Disassembly the bolt and take out the parts as shown

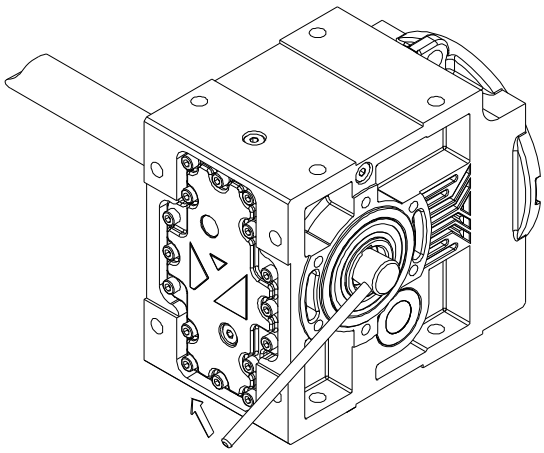


g2 -Use the disassembly set from STOEWER and fasten the bold as shown bellow to take out the output shaft. For disassembly sets look the following pages.



h- Shaft tightening torques

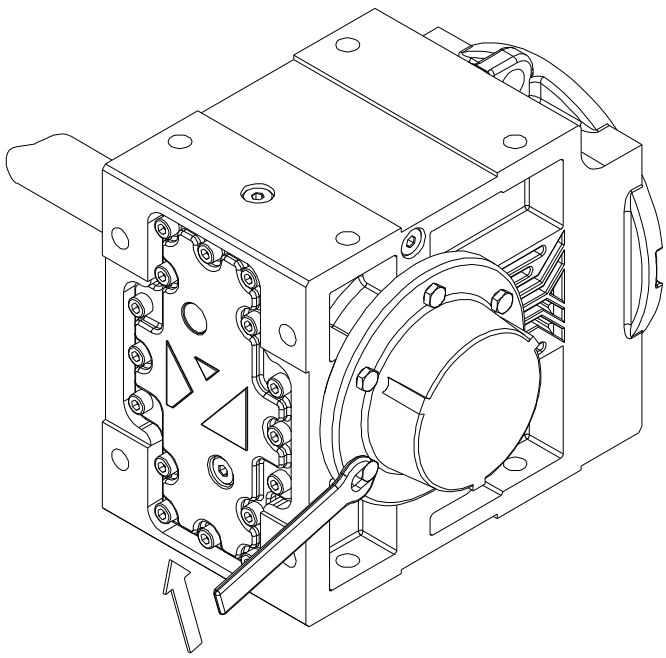
Use the following table for shaft tightening torques.



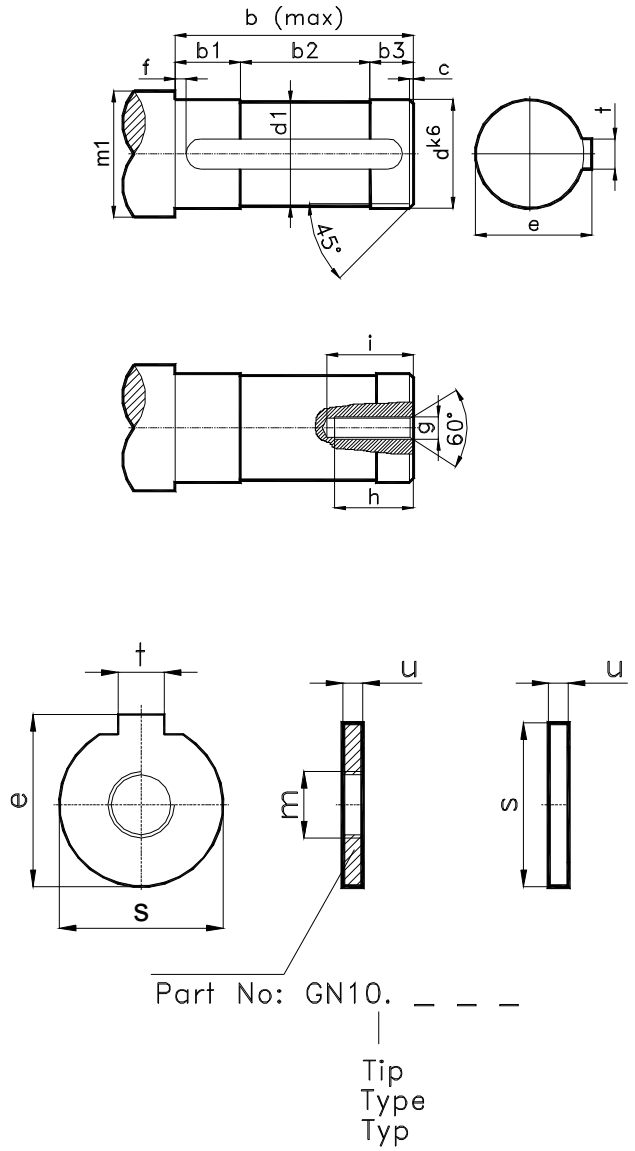
Type	Bolt	Tightening torque [Nm]
K.37...	M16	40
K.47...	M16	40
K.57...	M20	80
K.67...	M20	80
K.77...	M24	200
K.87...	M24	200

i- Covering all turning parts

All open turning parts must be covered. The Closing caps for oposide shaft output are provided by Stoewer and are assembled as shown bellow. The Output shaft side must also be covered by the machine manufacturer.



j- Recomended shaft dimensions and disassembling nut dimensions
Use the following part number for ordering the disassembling nut.

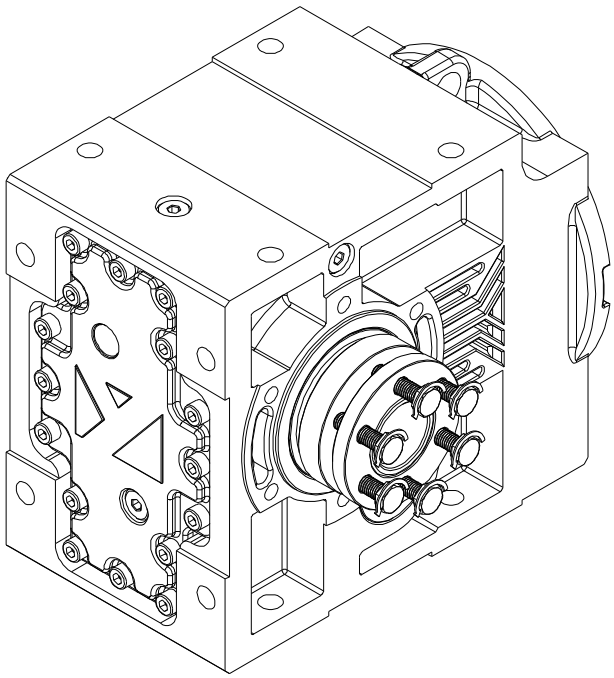


Example: GN10.KR373

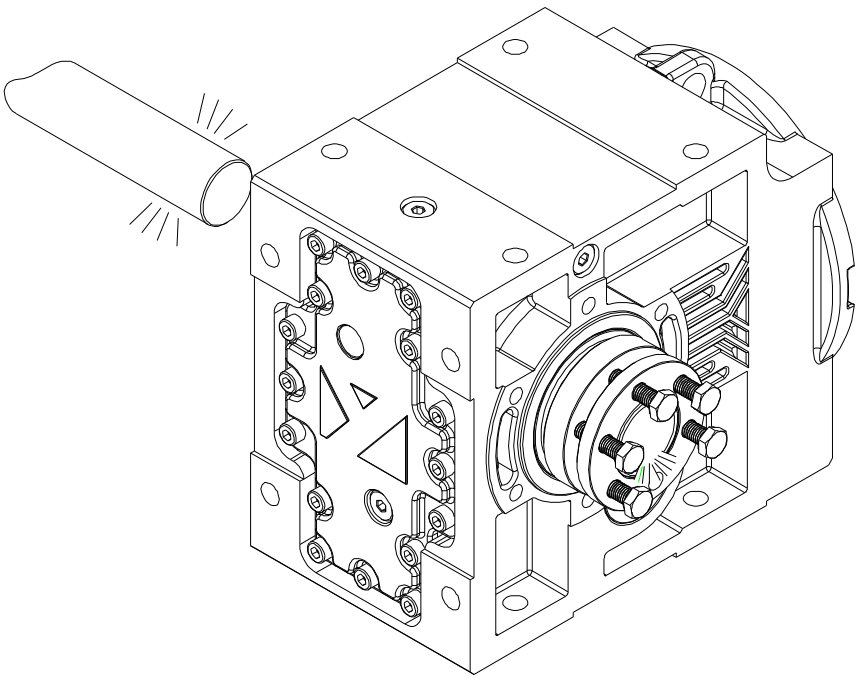
Tip	s	m	u	t	e	d	d1	b	b1	b2	b3	c	m1	f	h	i	g
KR373	39,5	M20	6	12	43	40	39	150	40	90	20	2	50	5	38	45	M16
KR473	49,5	M20	6	14	53,5	50	49	180	40	120	20	3	60	5	38	45	M16
KR573	59,5	M24	6	18	64	60	59	206	50	131	25	3	75	5	44	53	M20
KR673	69,5	M24	8	20	74	70	69	260	60	175	25	4	85	5	44	53	M20
KR773	89,5	M26	8	25	95	90	89	300	80	190	30	4	110	5	52	63	M24
KR873	109,5	M26	10	28	116	110	109	360	80	250	30	4	130	5	52	63	M24

k-Assembling customer shaft with shrinkdisc

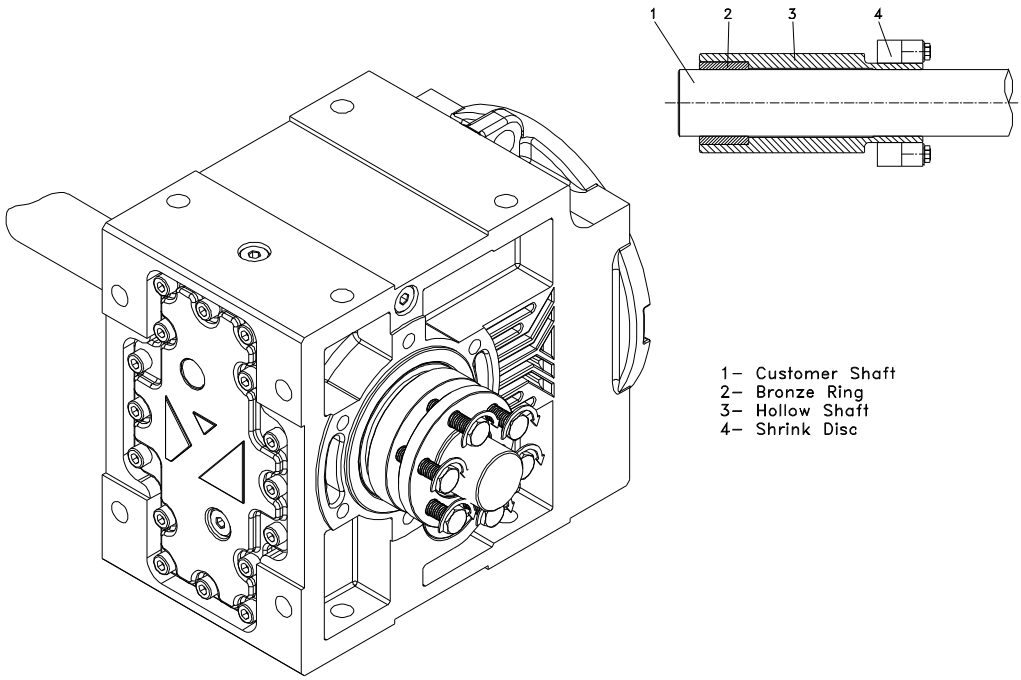
k1- Loosen the bolts of the shrinkdisc



k2-Use a solvent available in your market to clean all the dirt an oil from the shaft and shrink disk hollow. The surfaces must be free from oil or any dirt. The solvent must be removed from the surfaces ass well.

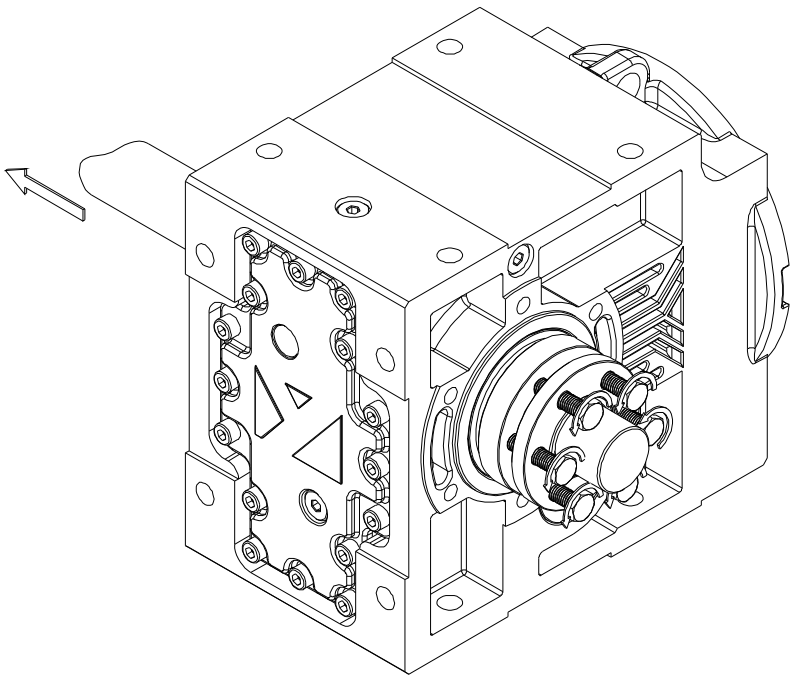


k3- Insert the shaft and tighten the bolts as shown. Be sure that there is a clearance between the shrinkdisc shoulder and the hollow shaft shoulder of the gearbox.



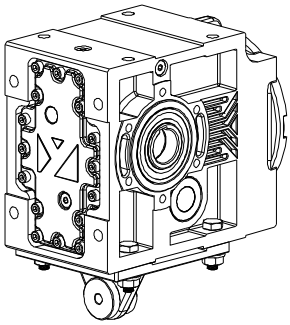
Type	Bolt	Tightening Torque [Nm]
K.37...	M8	30
K.47...	M8	30
K.57...	M10	60
K.67...	M10	60
K.77...	M12	100
K.87...	M14	200

l- Disassembling customer shaft with shrinkdisc

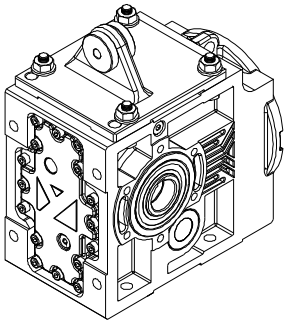


m- Assembling Gear Unit with Torque Arm

m1- The following connecting possibilities are avaliable. Use one position which is the most suitable.

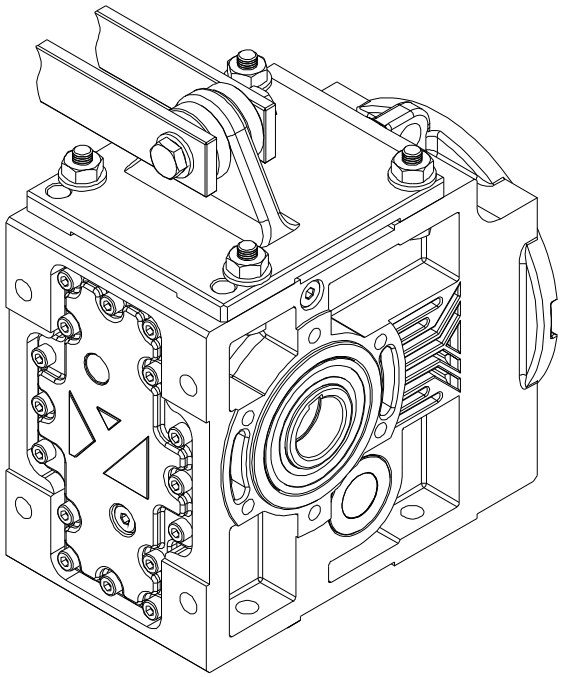


A

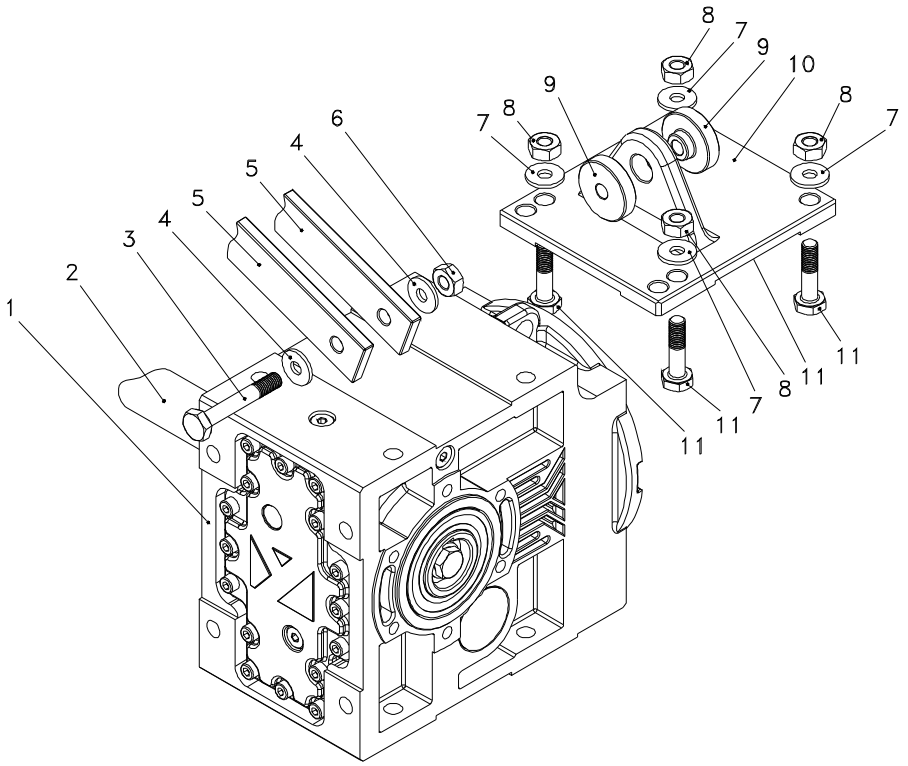


B

C

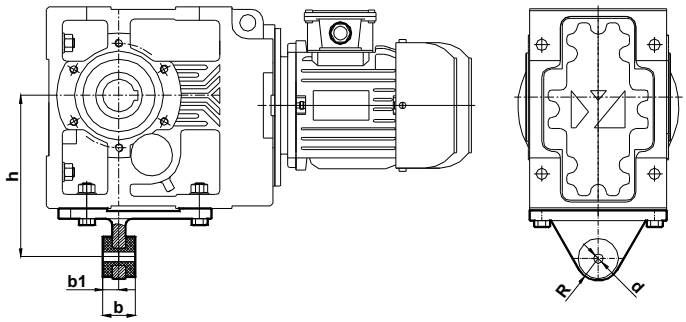


m2-Assemble the parts as shown bellow

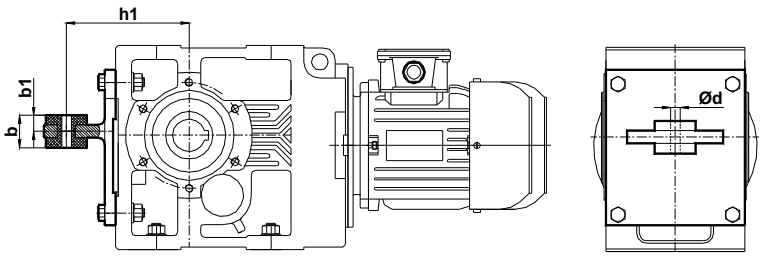


1- Gear Unit	4- Spacer Ring	7- Spacer Ring	10- Torque Arm
2- Assembled Shaft	5- Machine Extension	8- Nut	11- Bolt
3- Bolt	6- Nut	9- Rubber Buffer	

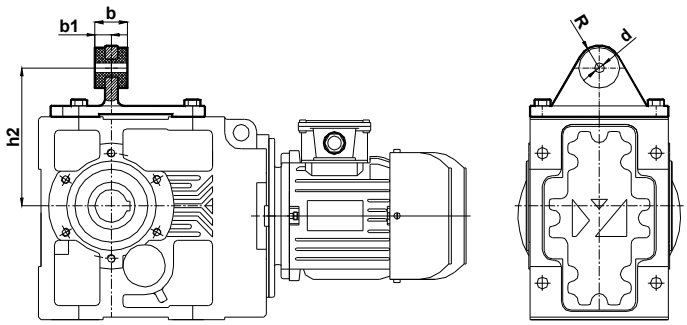
m3-For the fixing bold position refer to the following dimensions



Std.



T1

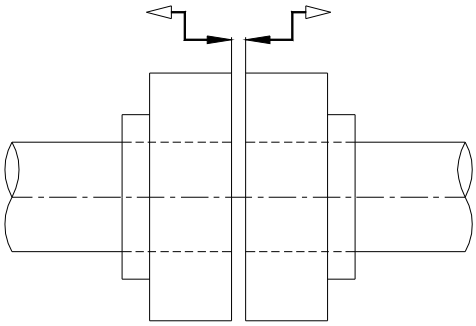


T2

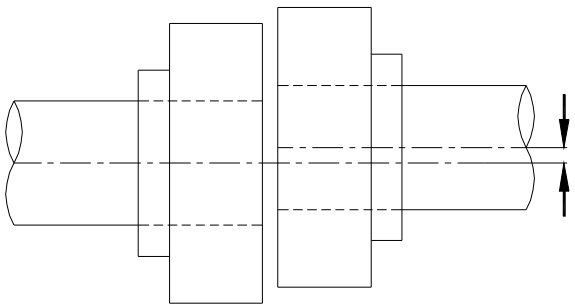
					Std.	T1	T2
Type	**b**	**b1**	**d**	**R**	**h**	**h1**	**h2**
KR373.10	40	20	12	27,5	200	150	170
KR473.10	50	25	14	27,5	250	182	210
KR573.10	55	27,5	14	27,5	300	220	251
KR673.10	60	30	16	27,5	350	245	260
KR773.10	70	35	26	50	450	335	360
KR873.10	80	40	28	55	550	400	410

n- Fittting Couplings

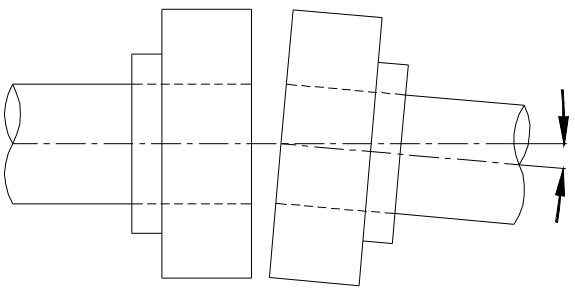
n1-By fitting couplings be sure that there is some clearanve between the two elements



n2-By fitting couplings be sure that there is no exantricity between the two shafts.



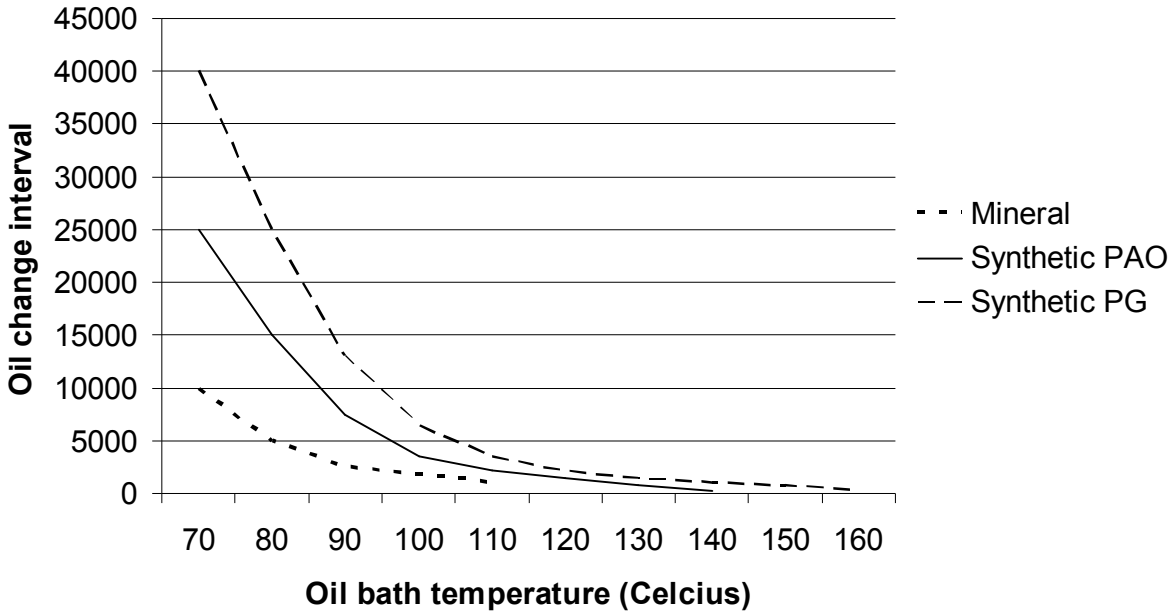
n3-By fitting couplings be sure that the two shafts are not angular miss-aligned.



7- Inspections

Under normal ambient and working conditions the gear unit should be checked according the following intervals. (For definition of normal working conditions refer to the product catalogue: "Selecting Gearbox" section);

Item to check / replace	Every 3.000 working hours or every 6 months	Every 4.000 working hours	Every 10.000 working hours or every 3 years	Every 25.000 working hours
Check for oil leakage	x			
Check for oil level	x			
Check oil leakage from seal	x			
Check Rubber buffer	x (Change if necessary)			
Check Bearings Noise		x (Change if necessary)		
Change Mineral Oil			x (See Below for details)	
Change Synthetic-PAO Oil				x (See Below for details)
Change Sealing				x
Change Bearing Grease				x
Change Bearings				x
Check for noise Changes				x



For normal ambient conditions 70 degrees Celcius Should be taken as referance

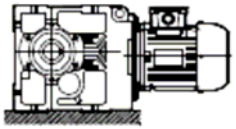
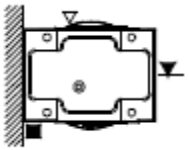
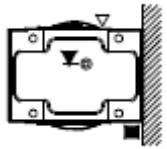
* For K series Mineral oil is used unless it is differently ordered. For oil type and quantities refer to the following tables.

8- Lubrication

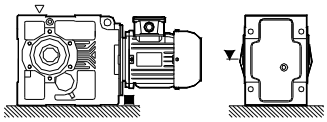
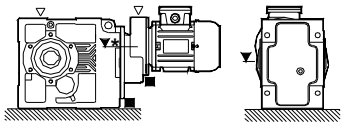
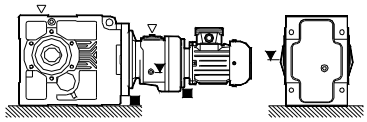
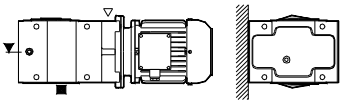
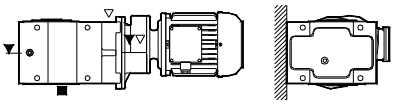
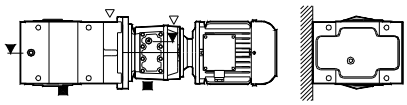
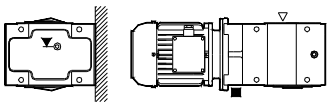
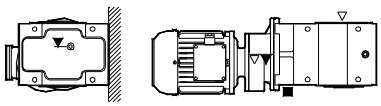
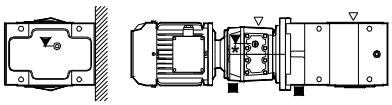
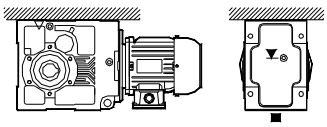
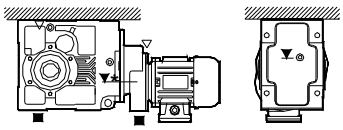
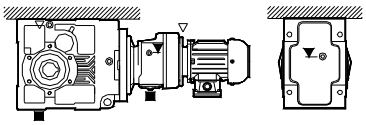
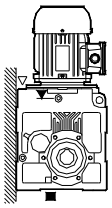
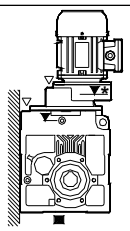
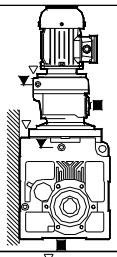
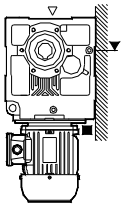
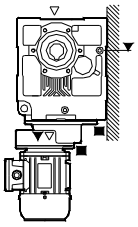
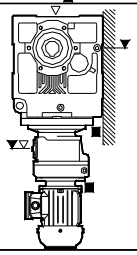
a- Oil Types

Lubricant Art des Schmierstoffes	*Usage Temparature* Gebrauchstemperature	*ISO Viscosity Class* Vizkozitäts Klasse ISO	ARAL	bp	ESSO	KLÜBER	Mobil	Shell	Castrol
Mineral Oil Mineralöl	0 ... +100	ISO VG 680	Degol BG 680	Energol GR-XP680	Spartan EP 680		Mobilgear 636	Omala 680	Alpha SP 680
	0 ... +100	ISO VG 460	Degol BG 460	Energol GR-XP460	Spartan EP 460	GEM 1 680	Mobilgear 634	Omala 460	Alpha SP 460
	0 ... +100	ISO VG 320	Degol BG 320	Energol GR-XP320	Spartan EP 320	GEM 1 460 GEM 1 320	Mobilgear 632	Omala 320	Alpha SP 320
	-5 ... +100	**ISO VG 220**	**Degol BG 220**	**Energol GR-XP220**	**Spartan EP 220**	**GEM 1 220**	**Mobilgear 630**	**Omala 220**	Alpha SP 220
	-5...+100	ISO VG 150	Degol BG 150	Energol GR-XP150	Spartan EP 150	GEM 1 150 GEM 1 100	Mobilgear 629	Omala 150	Alpha SP 150
	-5...+100	ISO VG 100	Degol BG100	Energol GR-XP100	Spartan EP 100		Mobilgear 627	Omala 100	Alpha SP 100
Synthetic Oil Synthetisch Öl	-20 ... +140	ISO VG 680	Degol GS 680	Enersyn SG-XP680		Syntheso D 680 EP	Gylgoyle HE 680		
	-20 ... +140	ISO VG 460	Degol GS 460	Enersyn SG-XP460	Glycolube 460	Syntheso D 460 EP	Gylgoyle HE 460	Tivela SD	Alphasyon PG 460
	-25 ... +140	ISO VG 320	Degol GS 320	Enersyn SG-XP320	Glycolube 320	Syntheso D 320 EP	Gylgoyle HE 320		Alphasyon PG 320
	-25 ... +140	**ISO VG 220**	**Degol GS 220**	**Enersyn SG-XP220**		**Syntheso D 220 EP**	**Gylgole HE 220**	Tivela WB	Alphasyon PG 220
	-30 ... +140	ISO VG 150	Degol GS 150	Enersyn SG-XP 150		Syntheso D 150 EP			Alphasyon PG 150
	-30 ... +140	ISO VG 100		Enersyn SG-XP 100		Syntheso D 150 EP			
Minaral *Grease* / Mineral Fett	-20 ... +120		Aralup HL 3	Energrease LS 3	Beacon 3	Centoplex 2	Mobilux 2	Alvania R3	Spheerol APT 3
Synthetic Grease / Synthetisch gres	-30 ... +100					ISOFLEX Topas L152	Mobiltemp SHC 100	Cassida RLS 00	

Oil Quantities. (lt)

Type Typ		 V6				
	B3	**V6**	**B8**	**V5**	**B6**	**B7**
Double-Triple reduction Helical Hollow Shaft Types						
KR 273	1,40	1,40	1,40	2,25	1,40	1,40
KR 373	2,10	2,10	2,10	3,40	2,10	2,10
KR 473	5,00	5,00	5,00	7,15	5,00	5,00
KR 573	6,00	6,00	6,00	10,60	6,00	6,00
KR 673	13,5	13,5	13,5	21,5	13,5	13,5
KR 773	20	20	20	36	20	20
KR 873	35	35	35	56	35	35
Four Stage Reduction Helical Hollow Shaft Types						
KR 374	2,1 / 0,7	2,1 / 0,7	2,1 / 0,7	3,9 / 0,7	2,1 / 0,7	2,1 / 0,7
KR 474	5,5 / 1,5	5,5 / 1,5	5,5 / 1,5	7,15 / 1,5	5,5 / 1,5	5,5 / 1,5
KR 574	6,0 / 1,5	6,0 / 1,5	6,0 / 1,5	10,6 / 1,5	6,0 / 1,5	6,0 / 1,5
KR 674	13,5 / 4,0	13,5 / 4,0	13,5 / 4,0	21,5 / 4,0	13,5 / 4,0	13,5 / 4,0
KR 774	20 / 4,0	20 / 4,0	20 / 4,0	36 / 4,0	20 / 4,0	20 / 4,0
KR 874	35 / 4,0	35 / 4,0	35 / 4,0	56 / 4,0	35 / 4,0	35 / 4,0
Five-Six Stage Reduction Helical Hollow Shaft Types						
KR 275 / 276	1,40 / 0,4	1,40 / 0,4	1,40 / 0,4	2,25 / 0,4	1,40 / 0,4	1,40 / 0,4
KR 375 / 376	2,1 / 0,85	2,1 / 0,85	2,1 / 0,85	3,9 / 0,85	2,1 / 0,85	2,1 / 0,85
KR 475 / 476	5,5 / 1,9	5,5 / 1,9	5,5 / 1,9	7,15 / 1,9	5,5 / 1,9	5,5 / 1,9
KR 575 / 576	6,0 / 1,75	6,0 / 1,75	6,0 / 1,75	10,6 / 1,75	6,0 / 1,75	6,0 / 1,75
KR 675 / 676	13,5 / 3,1	13,5 / 3,1	13,5 / 3,1	21,5 / 3,1	13,5 / 3,1	13,5 / 3,1
KR 775 / 776	20 / 3,1	20 / 3,1	20 / 3,1	36/ 3,1	20 / 3,1	20 / 3,1
KR 875 / 876	35 / 3,1	35 / 3,1	35 / 3,1	56 / 3,1	35 / 3,1	35 / 3,1

c- Mounting Positions

	KR373-KR873	KR374-KR874	KR375-KR875 / KR376-KR876
B3			
B6			
B7			
B8			
V5			
V6			

Symbols : ■ *: Drain plug* ▽ *: Vent plug* ▼ **:** *Oil level* ✳ **:***Only upon request*

9- Troubleshooting Guide

All the operations bellow must be done by experienced mechanichan/electrican. Do not make anythink if you are not sure what you are doing and contact STOEWER. Any change or operation done without the information of STOEWER ANTRIEBSTECHNIK is in your own risk and responsibility and STOEWER does not take any responsibility.

ID	Problem	Observation	Remedy
001	Gearbox Does Not Start Up	You hear no noise and shaft is not turning. You are not using any driver or frequency inverter.	Please Check the voltage supply and frequency of your electric connection. They must be in accordance with the nameplate of the motor. Observe motor manufacturers start up manual. Still does not work go to ID 100
002	Gearbox Does Not Start Up	You hear no noise and shaft is not turning. You are using frequency inverter or driver.	Please observe the frequency incerter/driver manual. Chech the motor by supplying direct voltage to see if the problem is on your driver/frequency inverter. Still does not work go to ID 001.
003	Gearbox Does Not Start Up	You hear some noise but both motor shaft and gearbox shaft is not turning. You are not using any driver /frequency inverter or braked motor.	Please Check the voltage supply and frequency of your electric connection. They must be in accordance with the nameplate of the motor. Observe motor manufacturers start up manual. Still same problem, the load may be too high for the choosen motor. Loosen the gearbox from the load/torque. If it works than the starting torque is insufficient and higher motor power is needed. For monophaze motors, check the starting up condansator and running condansator as well. If notting helps go to ID 100
004	Gearbox Does Not Start Up	You hear some noise but both motor shaft and gearbox shaft is not turning. You are using driver or frequency inverter.	Please observe the frequency inverters or drivers manual. To see if the problem is on your driver or frequency inverter take out the driver/frequency inverter and make direct voltage supply to the motor according the motors nameplate. Still does not work go to ID 100
005	Gearbox Does Not Start Up	You hear some noise but both motor shaft and gearbox shaft is not turning. You are using braked motor	Please Check the voltage supply and frequency of your electric connection. They must be in accordance with the nameplate of the motor. Observe motor manufacturers start up manual. Be sure that the brake is working. Observe the brake manufacturers manuel. If brake is supplied from STOEWER observe this manuel for correct brake wiring diagram. If still not work supply the brake with voltage according its nameplate directly. For example 198V DC. You will hear a clicking noise explaining that the brake is opening. If you hear no noise the brake or rectifier is defect. If you hear the clicking noise the brake is working. You should this clicking noise by your normal electric connection as well. By supplying direct supply to the brake you hear the clicking noise and at same time you supply the motor with direct voltage according to its name plate and still same problem, the load may be too high for the choosen motor. Goto ID 003.

ID	Problem	Observation	Remedy
006	Gearbox Does Not Work in Low Speeds/frequencies.	You are using frequency inverter.	For very low speeds the frequency inverters frequency is lowering down. For very low frequencies the inverter parameter and motor parameter must be optimized. Also for low speeds the efficiency of the gearbox may varry too much. Specially for worm-gearboxes. The recomended frequency range is 20-70 Hz for worm-gearboxes and 10-70 Hz for Helical Gear Boxes. Use Higher motor power and Frequency inverter or change ratio of gearbox to work inside the reccomended range.
007	Gearbox Does Not Start Mornings or After Long Time Stop.	Ambient Temperature is below +5 Celsius	The oil is not in accordance with your working conditions. Change to lower viscosity oils. Observe this manuel for using the correct oil. Working in higher ambient temperatures is an other solution if possible. If still same problem you need higher motor power.
008	Gearbox is Heating Up too Much	You are using Worm Gear Box and ambient tenp is lower than +40 Celsius	Measure the surface temp. using a temperature measuring device under full load. If the temp is under +80 Celsius this will make no harm to the gearbox and is normal. All ATEX conforming gearboxes and standart worm gearboxes are designed to work under max. +120 Celsius. If higher than +120 Celsius and using ATEX conforming gear box immidiately stop the system and contact STOEWER _____. Go to ID 100. If not ATEX confirming check the oil type and oil quantitiy/level according your mounting position and check the nameplate mounting position. If nameplate mounting position does not fit the actual position goto ID 100.
009	Gearbox is Heating Up too Much	You are using Helical Gear Box. Ambient temp is lower than +40 Celsius	Measure the surface temp. using a temperature measuring device under full load. If the temp is under +80 Celsius this will make no harm to the gearbox and is normal. All ATEX conforming gearboxes are designed to work under max. +120 Celsius. If higher than +120 Celsius and using ATEX conforming gear box immidiately stop the system and contact STOEWER _____. If not ATEX gearbox the gearbox is designed to work under max. +80 Celsious. If higher than +80 Celsius check the oil type and oil quantitiy/level according your mounting position and check the nameplate mounting position. If nameplate mounting position does not fit the actual position goto ID 100
010	Gearbox is Heating Up too Much	Ambient Temp is over +40 Celsius	Standart Gearboxes are designed to work under +40 Celsius. ambient temperature. If ambient temp is higher than +40 Celsius special solutions/gearboxes are required. Please contact STOEWER
011	Gearbox is noisy	Nois is regular continious	Check Your moving parts for noise. Disassemble the gearbox and run without load. If you still hear the noise motor bearings or gearbox bearings are defect. Change bearings. Goto ID 100
012	Gearbox is noisy	Nois is random	Check Your moving parts for noise. Disassemble the gearbox and run without load. If you hear still the noise the oil may has some particles inside. Change the oil and look for small particles. If metal particles are found the gearbox may have some demage. Goto ID 100

ID	Problem	Observation	Remedy
013	Gearbox is noisy	Regular nocking noise	Check Your moving parts for noise. Disassemble the gearbox and run without load. If you still hear the noise one of the gears inside is defect. Goto ID 10
014	Gearbox is noisy	Regular up and down noise (Sinosial noise)	Check the output-shaft connection alements for runout. Take out the output shaft element and run without load. If you still hear the noise one of the gears has runout problem. Goto ID 10
015	Gearbox is noisy	Gearbox is with braked motor and noise is comming from the brake side randomly.	Low randomly clicking noise may come from the brake disk which is normal. If noise level is disturbing the brake may be defect or brake clearance is not adjusted. Goto ID 100
016	Gearbox is noisy	You are using frequency inverter and the noise level is changing according your speed.	The frequency inverter parameters are not optimized for the frequency range or motor you are using. Observe the frequency inverters manual. If still same problem change the ratio of gearbox. Goto ID 100
017	Oil is Leaking	Oil Leakage from Seal	If ambient Temp is over +40 Celsious or none stop work over 16 hours please change the top plug with a breather plug. Observe this manual for using breather plug. If this is not your case the seal could be damaged. Goto ID 100
018	Oil is Leaking	Oil Leakage from Plug	If you are using breather plug be sure it is in the correct place. This is the most top plug position according your mounting position. The plug may be not tight enough. There are some particles under the plug rubber surface. Clean and tifgten the plug. If still same problem goto ID 100
019	Oil is Leaking	Oil Leakage from Housing	Observe exactly where the oil is comming out. It could be seal or plug point where it comes out and leakes over the housing. If this is your case goto ID 018/019. If you are sure oil comes out from housing than housing has some micro split / crack. Goto ID 100
020	Oil is Leaking	Oil Leakage from Cover	The sealing liquit under cover is split/defect. Disassemle the cover and put new sealing liquit. Assemle the cover and tighten the bolts. If still same problem goto ID 100
021	Gearbox is moving regularly on its mounting point	You are using Torque Arm	The movement of gear box is because of the runout of the shaft which you assemle the gearbox. This has no bad affect or harm to the gearbox and is normal unless you are using torque arm.
022	Gearbox is moving randomly on its mounting point	You are using Torque Arm	The movement of gear box is because of the runout and clearance of the shaft which you assemle the gearbox. Check the clearance of the assemling shaft and the clearances on your machine. This has no bad affect or harm to the gearbox unless you are using torque arm.
023	Motor is heating up	Motor is running over its nominal current	The motor power is not enough or some overload to the motor is possible. The motor may be defect. Goto ID 100
023	Motor is heating up	Ambient is dusty	Check the motor Fan Hub and rips. They must be free of dust. If you are using forced external fan, check if it is working. If you are using frequency inverter in low speeds and you do not have forced external fan, you may need forced external fan. Goto ID 100

ID	Problem	Observation	Remedy
024	Motor is running but Gearbox shaft does not turn	Scratchinh noise comes out	Some part (key, gear) may be defect inside gearbox. Goto ID 10
025	Gearbox Housing is Defect	You are using chain drive or pinion gear	The radial load or poligon effect of the chain may have caused the damage. Check also if the assembly bolts are loosened or the plate you assemble the gearbox is rigit enough. Check if you are using the correct diameter of chain drive and you are not exceeding max. allowed radial load. Check the position of your output element and re-calculate your radyal load and check if this fit to tha maximum allowed radial load. Goto ID 100
026	Output Shaft is Defect	You are using chain drive or pinion gear	The radial load or poligon effect of the chain may have caused the damage. Check also if the assembly bolts are loosened or the plate you assemble the gearbox is rigit enough. Check if you are using the correct diameter of chain drive and you are not exceeding max. allowed radial load. Check the position of your output element and re-calculate your radyal load and check if this fit to tha maximum allowed radial load. Goto ID 100
027	Gearbox is stopping too late	You are using braked motor	Please check the wiring diagram of the brake. There are two different kind of brake wiring diagram. The standart gearbox delivered from our factory is set to delayed braking. For sudden braking check the wiring diagram.
028	Gearbox is starting too late	You are using braked motor	For fast opening of big brakes (over 100Nm), you may need shock transformators which is supplied by STOEWER Goto ID 100
100	Service Required	No self solution found	Please contact STOEWER Service point. See on the back side of this manual

Warranty Conditions:

1. The geared motors and gear units are warranted for two year except the electric motor. For motor warranty please refer to the manual of the electric motor manufacturer or the warranty document of the motor manufacturer. This warranty is valid only if the gearbox is assembled and started up according our operating instructions and is used under the allowed conditions for the appropriate gearbox type in our catalogue.

2. The warranty time starts from the start up time written on the warranty document and last for two years. If the start-up time is more then three months after the billing time, the total warranty time is limited to 27 months starting from billing time. If the warranty document is not send to our company after start-up, the total warranty time will be limited to 24 months after the billing time.

3. Any time during the warranty for maintenance, repair or change will be added to the warranty time. This time starts from the date which the company or representative was made aware of the problem and ends on the date of the re-start-up.

4. If the product fails to operate because of a manufacturing or assembly failure during the warranty time, the product will be repaired free of charge.

5. If the product fails to operate because of a manufacturing or assembly failure during the warranty time and it is not possible to repair it, the product will be changed with a new one according to the report from our service department mentioning that the hazard can not be repaired.

6. Costumers must inform the manufacturer if there are some problems after the service and repair of the failed product.

7. The extra costs like stopped plant, physical or mental injuries etc. by the costumer side are not covered by this warranty except the product itself.